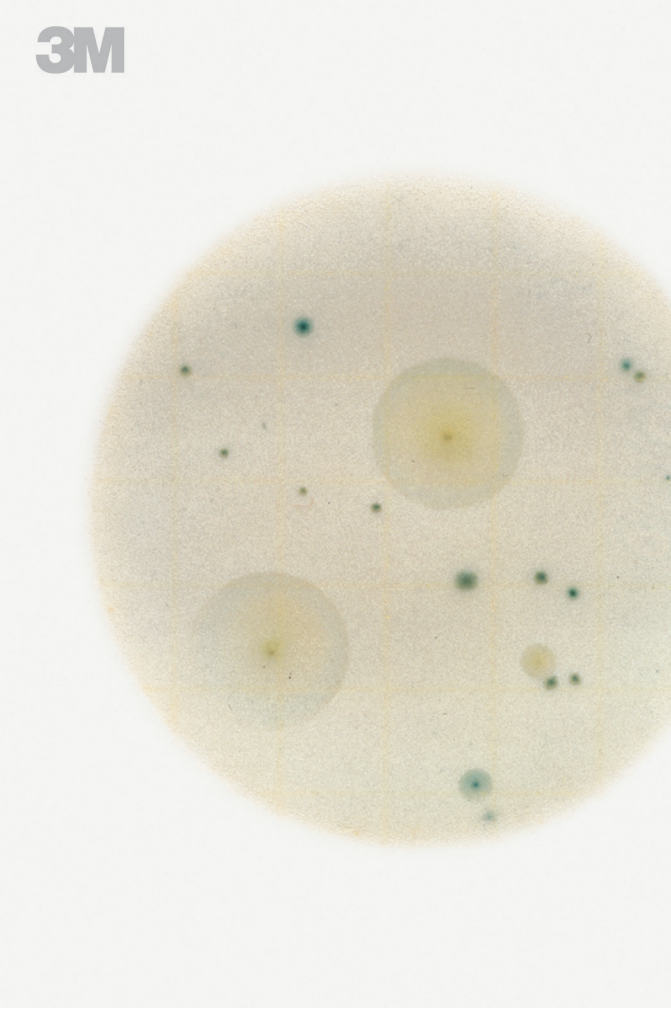
3M

Petrifilm™

Interpretation guide

The 3M™ Petrifilm™ Yeast and Mold Count Plate is a sample-ready culture medium system which contains nutrients supplemented with antibiotics, a cold-water-soluble gelling agent, and an indicator that facilitates yeast and mold enumeration. Petrifilm Yeast and Mold count plates are used for the enumeration of yeast and mould in the food and beverage industries.



YM

Yeast and Mold Count Plate

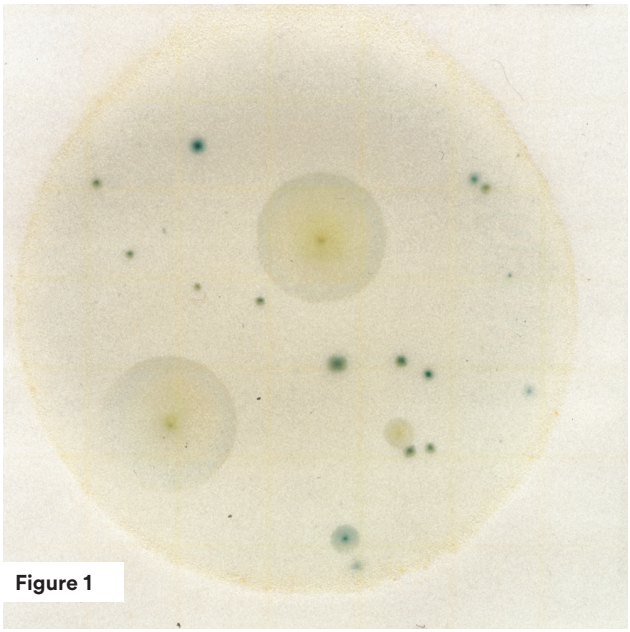


Figure 1

Total count = 20
Yeast count = 16
Mould count = 4

3M™ Petrifilm™ Yeast and Mold Count Plate contains both yeast colonies and mold colonies.

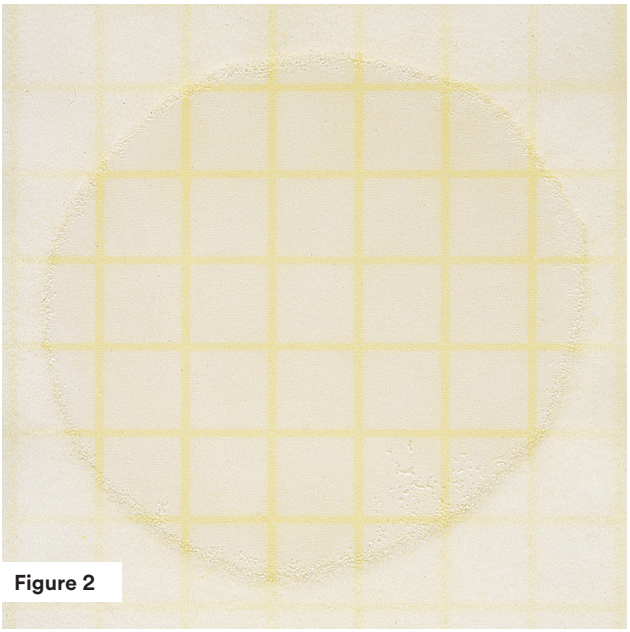


Figure 2

Yeast and mould count = 0

Petrifilm Yeast and Mold count plate without yeast or molds. Gridlines are visible with the use of a backlight to assist with estimated enumeration.

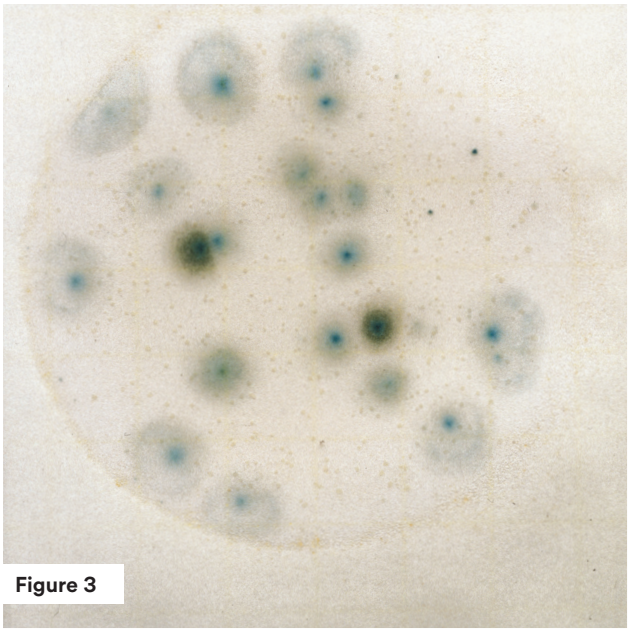


Figure 3

Estimated total count = 500
Estimated yeast count = 480
Estimated mould count = 21

When colonies number more than 150, estimate the count. Gridlines are visible with the use of a backlight to assist with estimated enumeration. Determine the average number of colonies in one square (1 cm^2) and multiply it by 30 to obtain the total count per plate. The inoculated area is approximately 30 cm^2. Yeast colonies may range in colour from tan (as in this example) to pink to blue-green.

For a more accurate count, further dilution of the sample may be necessary.

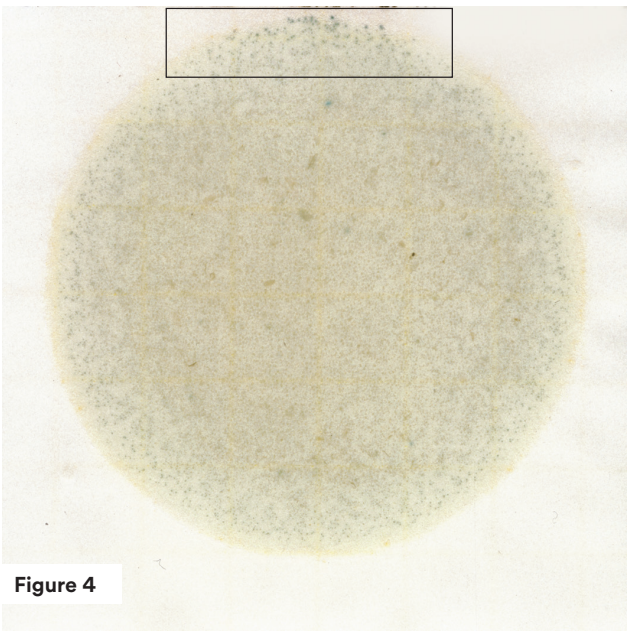


Figure 4

Estimated yeast count = TNTC

Petrifilm Yeast and Mold count plate containing yeast colonies too numerous to count (TNTC). The small, blue colonies at the edge of the plate (highlighted in the box) are present throughout the entire plate although less visible.

For a more accurate count, further dilution of the sample may be necessary.

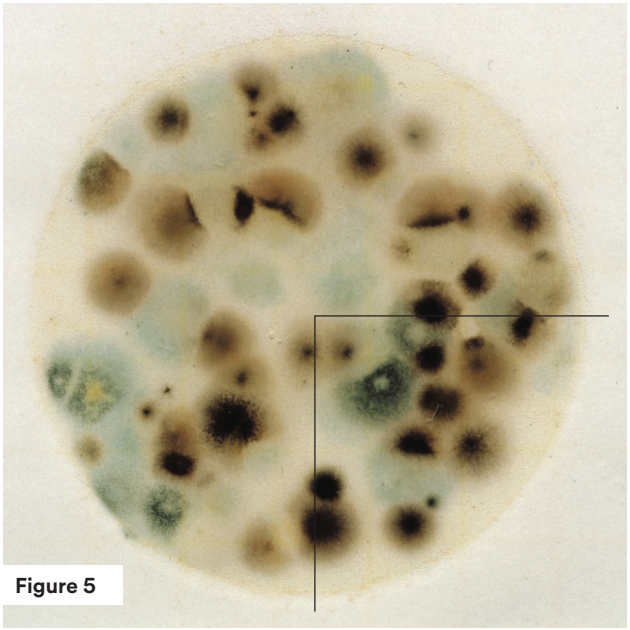


Figure 5

Estimated mould count = 64

Mold colonies are beginning to crowd and overlap each other on the plate. Count each colony margin or focus. The plate can be divided into sections to assist in counting. In this example, approximately 1/4 of the plate was counted, then the number of colonies counted was multiplied by 4 to get the estimated count on the plate. The section shown has 16 molds.

For a more accurate count, further dilution of the sample may be necessary.

Figure 6a

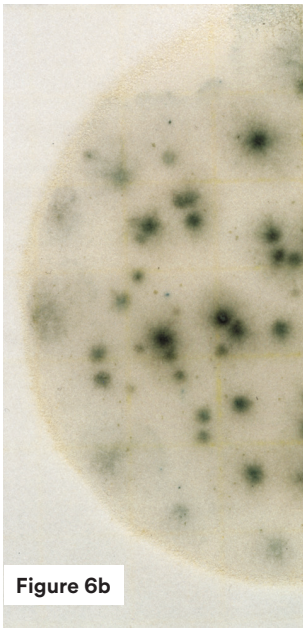


Figure 6b

Mould count = TNTC **Mould count = 64**

Plates in Figures 6a and 6b are the same sample. Figure 6a is a 1:10 dilution and has colonies that are small, faint and numerous, making it difficult to count. Figure 6b is a 1:100 dilution and shows how diluting a sample to obtain a colony count of less than 150 colonies makes counting easier. As with most growth media, in a highly competitive environment (such as Figure 6a), typical colony growth will be inhibited. For heavily contaminated samples such as these, further dilutions are recommended for a more accurate count and more typical colony growth (as in Figure 6b).

Macroscopic differentiation

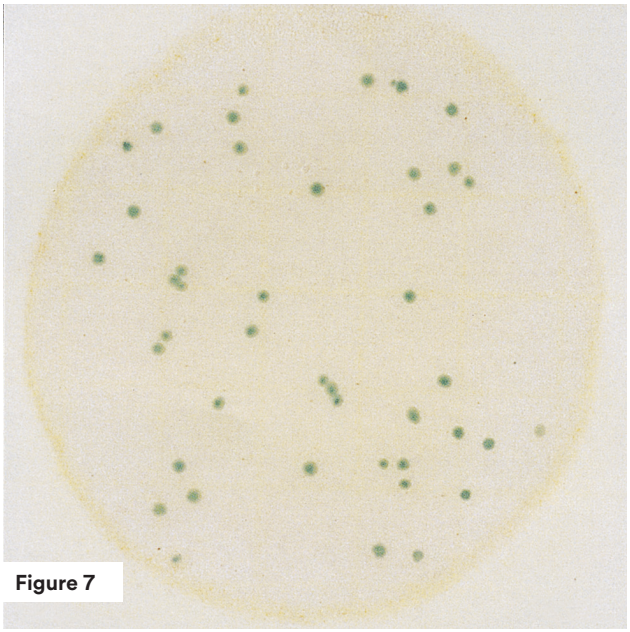


Figure 7

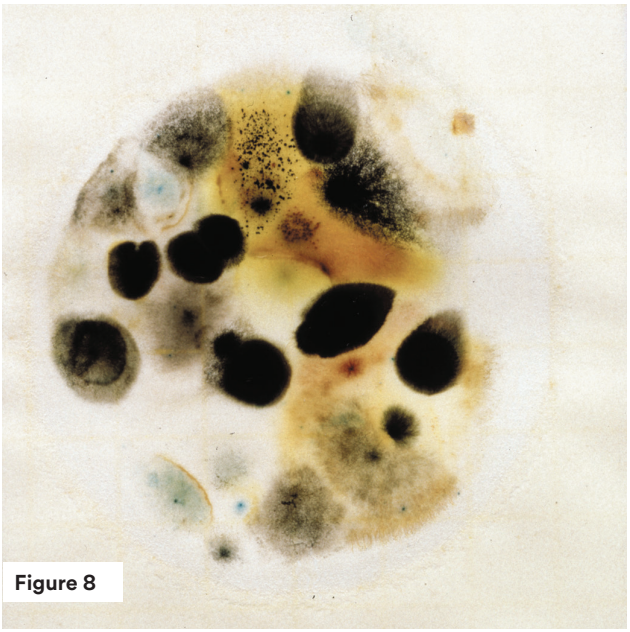


Figure 8

Yeast count = 43

Figure 9 shows typical yeast colonies. Characteristics typical of yeast include:

- Colony is small
- Colony has defined edges
- Colony colour can range from pink-tan to blue-green
- Colony may appear raised
- Colony typically is uniform in colour, no center focus (dark center)

Mould count = 29

Figure 10 shows typical mould colonies. Characteristics typical of mould include:

- Colony grows large
- Colony has diffuse edges
- Colony colour may vary as moulds produce a variety of pigments (i.e., brown, beige, orange, blue-green)
- Colony appears flat
- Colony usually has a center focus (i.e., usually darker in colour, may also be different colour)

Microscopic differentiation

Yeasts and moulds are closely related and cannot always be distinguished from each other without microscopic examination.

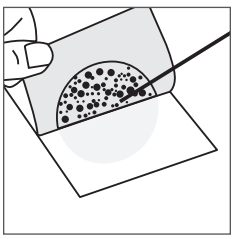


Figure 9

To isolate colonies for further identification, lift the top film and pick from the colony within the gel using a loop or similar device.

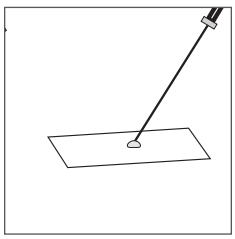


Figure 10

Transfer the colony to a drop of sterile water on a microscope slide, cover with a coverslip, and view under a microscope.

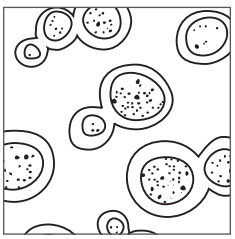


Figure 11

Yeast typically appear oval and may show budding.

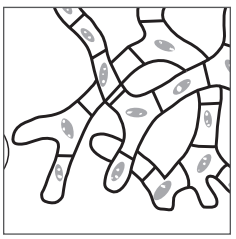


Figure 12

Mould typically appear as branching or thread-like filaments (mycelium).

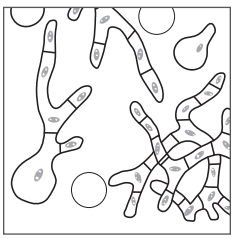


Figure 13

Moulds shown above are in various stages of germination.

Phosphatase reaction

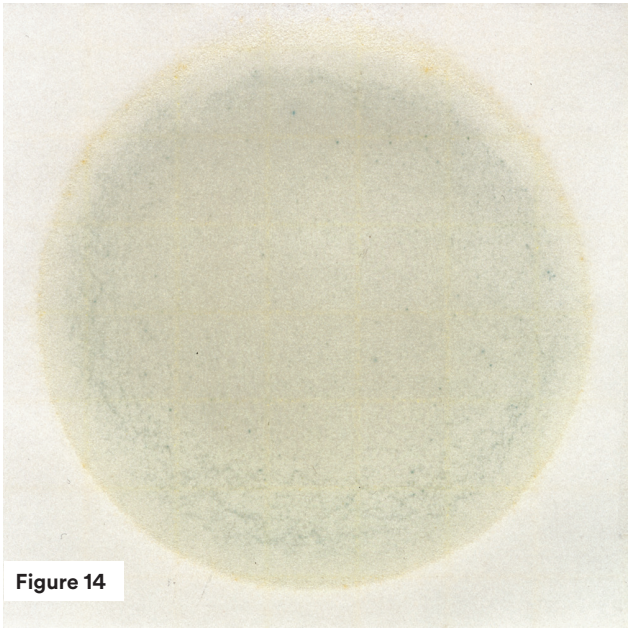


Figure 14

Yeast and mould count = 0

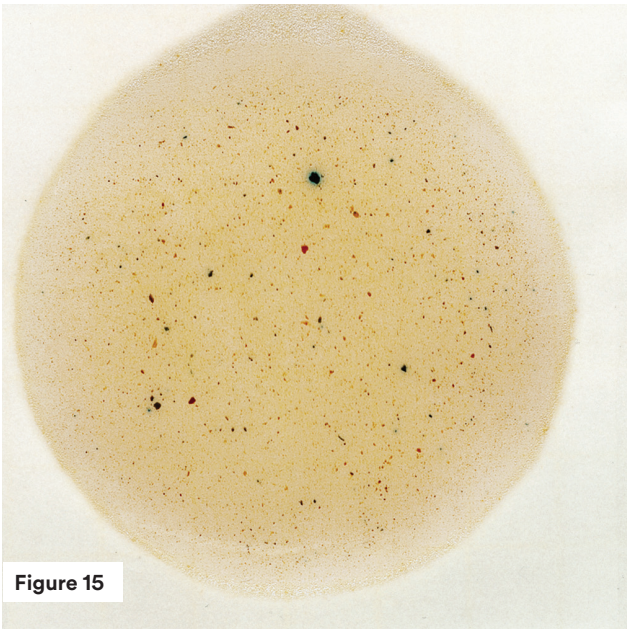


Figure 15

Yeast and mould count = 0

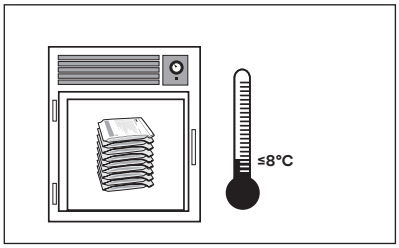
The 3M™ Petrifilm™ Yeast and Mold Count Plates utilise a phosphatase indicator dye. All living cells contain phosphatase; therefore, natural phosphatase in samples can cause the indicator to react. Two types of colour reactions are sometimes seen: a uniform blue background colour or intense, blue spots. Figure 7 shows uniform blue background color and Figure 8 shows intense blue spots which are often seen with spices or granulated products. Figure 8 also shows food particles that yielded phosphatase.

To reduce a phosphatase reaction, follow one or more of these techniques:

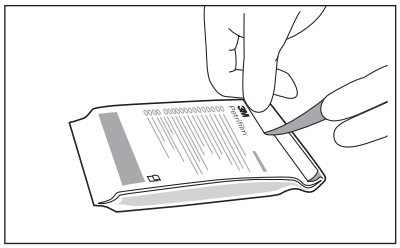
1. Dilute Sample: Further sample dilution will minimise blue background colour or reduce the number of intense blue spots.
2. Sample Preparation: Mix sample and let settle for 3–5 minutes before plating. Draw sample from centre portion of sample container or use filtered homogenizer bag to avoid plating large particles.
3. Check and Note: Observe plates within 24-48 hours of incubation and make note of any colour change to aid in final interpretation.

Reminders for use

Storage

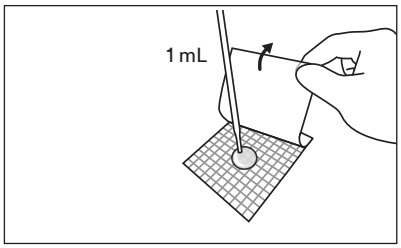


1 Store the unopened 3M™ Petrifilm™ Yeast and Mold Count Plate pouches at refrigerated or frozen at temperatures ≤8°C (≤46°F). Use before expiration date on package. Just prior to use, allow unopened pouches to come to room temperature before opening.

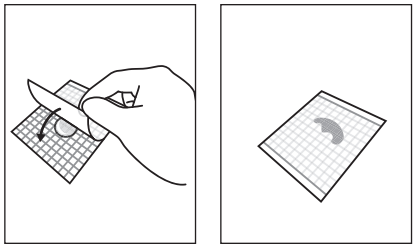


2 Seal by folding the end of the pouch over and applying adhesive tape. **To prevent exposure to moisture, do not refrigerate opened pouches.** Store resealed pouches in a cool, dry place for no longer than one month.

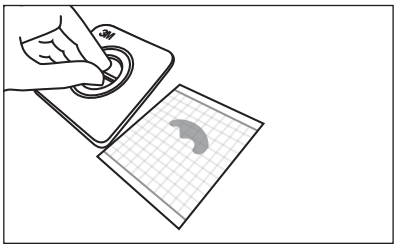
Inoculation



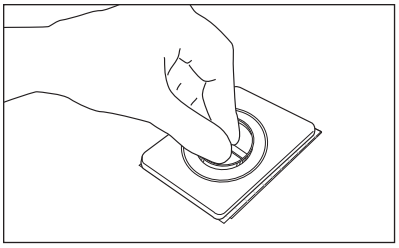
3 Place the Petrifilm Yeast and Mold count plate on a flat level surface. Lift the top film and with a pipette perpendicular to the inoculation area, dispense 1 mL of sample suspension onto the center of the bottom film.



4 Drop the top film down onto the sample.

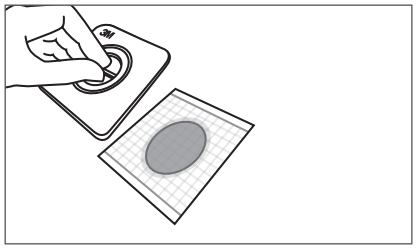


5 Place the 3M™ Petrifilm™ Yeast and Mold Spreader on the center of the plate.

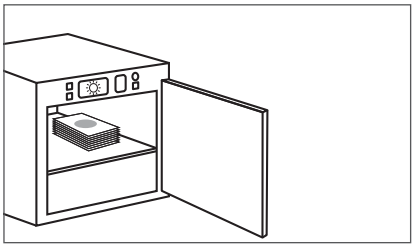


6 Gently apply pressure on the spreader to distribute the inoculum over circular area. Do not twist or slide the spreader.

Incubation

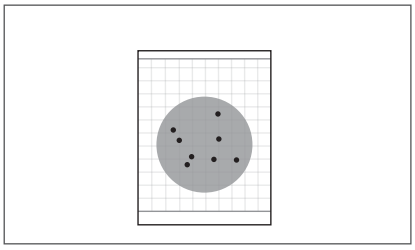


7 Lift the spreader and leave the plate undisturbed for at least one minute to permit the gel to form.



8 Incubate plates with clear side up in stacks of up to 20. **Please refer to product instructions for third party validated methods.** Because some molds may grow quickly, it may be useful to read and count plates at 3 days as smaller colonies may be obscured by larger, overgrown molds at 5 days. If this happens, the 3 day count may be used; however, it should be reported as an estimated count.

Interpretation



9 Petrifilm Yeast and Mold count plates can be counted using a standard colony counter or other illuminated magnifier.

Use appropriate sterile diluents

Butterfield's phosphate buffer, 0.1% peptone water, peptone salt diluent, saline solution (0.85-0.90%), bisulphite-free letheen broth or distilled water.

Do not use diluents containing citrate, bisulphite or thiosulfate with 3M™ Petrifilm™ Yeast and Mold Count Plates; they can inhibit growth.

If citrate buffer is indicated in the standard procedure, substitute with one of the buffers listed above, warmed to 40–45°C.

3M Food Safety offers a full line of products to accomplish a variety of your microbial testing needs. For more product information, visit us at **3M.com/foodsafety/Petrifilm**

User's Responsibilities: 3M™ Petrifilm™ Plate performance has not been evaluated with all combinations of microbial flora, incubation conditions and food matrices. It is the user's responsibility to determine that any test methods and results meet the user's requirements. Should re-printing of this Interpretation Guide be necessary, user's print settings may impact picture and colour quality.

3M UK PLC
Charnwood Campus
10 Bakewell Road
Loughborough LE11 5RB

emeafoodsafety@mmm.com
www.3M.co.uk/foodsafety

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